Oxygen: EU-Level Public Fund for the Maintenance of Open Source Infrastructure

matthew@matrix.org - April 6th 2024
Serkan Holat - April 7th 2024
Simon Phipps - April 7th 2024

This document is intended as a living proposal for folks to comment on. Dear reader: please feel free to go wild and add comments and corrections as you see fit. Disclaimer: I (Matthew) am not remotely an expert in public sector funding, so this may be horribly naïve and I may well be missing something.

Matrix room for real-time discussion: #project-oxygen:matrix.org

TL;DR: There should be an NLnet-style mechanism for funding maintenance of larger mature FOSS projects which have become critical infrastructure for the EU.

Context: this proposal was spawned out of https://matrix.org/blog/2024/04/open-source-publicly-funded-service/

Problem

- Free and open source software has become a shared digital public infrastructure (1).
- Expecting individual organisations/consumers to support their dependencies leads to the Free Rider problem (2, 3), a well-known issue in economics around public goods. This results in FOSS being undermaintained and underproduced.
- All other shared physical public infrastructure - bridges, roads, national defense, etc. is financed by public money (citation?).
- Even though FOSS is produced and maintained by private initiatives, similar to other public infrastructure, it should be funded by public money on behalf of the OSS consumers (taxpayers) to the extent the public sector depends on it.

Proposal

- We propose that the EU allocates €100M a year (via DG CNECT or similar) to fund the maintenance of open source infrastructure that the EU public sector depends upon.
  - (For reference, this compares to ~€2M/year at NLnet, or ~€3M/year for NGI)
  - In a future phase, this could extend to funding critical FOSS dependencies of EU private sector organisations too (perhaps by explicitly routing a form of consumption tax (for examples see 4, 5) to fund FOSS dependencies, thus mitigating the Free Rider problem from private sector orgs).
- This targets larger multi-person projects (e.g. Matrix, Mastodon, Python, Rust, etc) which are operationally used by EU states as open source infrastructure.

    - Typical funding levels would be €1-2M/year - funding ~10-20 full-time maintainers as a coherent existing team, as required to keep larger projects coherently maintained.
    - Projects can be identified based on Software Inventories data (e.g. from national or EU-level software inventories by collecting SBOMs data from individual organisations. The EU OSPO may already be doing this.)
    - One way of thinking about this would be that it is equivalent to a set of 6-month €50K NLNet grants… except that it would provide long-term support to the whole core team for the project, keeping it stable and intact, rather than each individual having to re-apply every 6 months. It would also be maintenance-based rather than project-based funding.
- Exclusively funds maintenance, not feature development:
    - Bug fixes
    - Handling security issues
    - Security audits
    - PRs
    - Refactoring
    - Performance improvements
    - Keeping pace with best practices
- The value for money of the funding must be quantified. However, the paradox of good maintenance is that it's very hard to quantify. Options could include:
    - Absence of CVEs?
    - Continuation for active maintenance at all (i.e. the project continuing to exist)?
    - Continuation to keep the core braintrust working it together fulltime?
    - Success in continuing to achieve the project's stated goal?
    - Size of bug queue?
    - Size of PR queue?
    - Number of commits?
    - NPS?
    - Number of downloads?
    - Number of active dependents?
    - Number of forks?
    - …however, none of these provide an ROI model in terms of $€_{out} = f(€_{in})$
- The cost of risk may be possible to quantify, eg, in lower reliability, data breaches, lower take up, lower competition if it is regarded as unreliable
- The alternative for funding these projects is either:
    - Donations from users/organisations/philanthropists to the project's non-profit foundation (e.g. The Matrix.org Foundation) or umbrella organisation (e.g. The Linux Foundation).
        - However, in practice the vast majority of private (and public) entities who benefit from FOSS foundations take them for granted, rather than contributing to support the commons. As a result, consciously funding the commons via taxpayer funds would solve the paradox that the more successful a project is, the more it is taken for granted.

        - Also, raising non-profit funding is a large full-time business in its own right, which is completely unrelated to writing and maintaining FOSS software
    - Funding via for-profit business (e.g. Element) - which risks creating incentives which harm the open source commons, e.g:
        - Selling support contracts which could encourage the open source project to deliberately be hard to support, in order to sell support contracts. In turn, work required to fulfil support contracts distracts from the core maintenance - and providing professional support is an entirely different business to writing FOSS. Often dedicated support suppliers will insert as intermediaries… and not fund upstream.
        - Focusing on building features (because features are easy to sell), but make the maintenance problem even worse.
        - Adopting an open core model, which encourages limiting the capabilities of the core open source project in order to make valuable proprietary add-ons (thus taking them out of the open source commons)
        - Switching to less permissive open source licences, in order to make it harder for competing for-profit businesses to build on the software, thus hindering usability of the commons.

Criteria

The funds would be distributed via a cascaded grant mechanism by NLnet or similar, with the following criteria:

- It funds non-profit software foundations or independent maintainers - *not* for-profit businesses. It would not fund umbrella organisations; they can apply on behalf of their individual component projects however.
- The funding has to go to the core project (not a 'third party maintenance provider' which acts to disintermediate the core project)
- It only funds FOSS work with an OSI/FSF-approved licence.
- It funds maintenance of established FOSS projects which EU states and the EU Institutions are operationally dependent upon for their infrastructure (using the OSI definition of FOSS)
- It does *not* fund experimental new FOSS projects (NLnet is surely much better suited to projects which are getting up and running).
- Recipients do not have to be in the EU - the criteria is that the EU is dependent upon their work.
- It provides a dependable ongoing source of funding for maintainers to maintain larger open source projects, without the core maintenance team being at risk.
- It does not fund feature work (The funding should be provided with no strings attached (it's up to the open source initiative to decide how to use the resources).
- Recipients would have to apply for funding.
- A college of their peers would evaluate and approve applications (per StandICT).
- Recipients would have to demonstrate use of funds towards maintenance (i.e. days clocked against PRs, bug fixes, security issues, etc).

- Grants would renew assuming use of funds is demonstrably being utilised.

Possible partners **(unsolicited suggestions):**

- The Matrix.org Foundation C.I.C
- Mastodon gGmbH
- The Document Foundation (Stiftung)
- The GNU Project
- GNOME
- KDE
- CNCF
- ffmpeg (although I don't think they have an org; they are a bunch of indie developers?)
- Generally:
    - List of free and open-source software organizations - Wikipedia (Project specific projects)
    - List of free and open-source software organizations - Wikipedia (Domain specific projects)

FAQ

- Does this reduce the competitiveness of open source projects? Substandard projects may be kept artificially alive via government funding, rather than being outcompeted by alternatives.
    - Matthew Hodgson no: substandard projects will be forked and improved even if they are well-funded, if they are stagnating or not performing. And then the funding should shift to the improved alternative. In other words, the free market of open source will keep itself optimal quality - and the injection of funding will accelerate this process.
- Does this help the xz/liblzma problem? (Would funds have helped Lasse maintain the project more successfully?)
    - Matthew Hodgson yes: even if Lasse didn't want to work on liblzma full time, this could have helped him work with an umbrella org to help find trusted and funded co-maintainers to share the load.
- Does an umbrella like LF with a large established non-profit fundraising operation provide a solution to this problem already?
    - Matthew Hodgson : Perhaps, but at the expense of independence of the recipient projects, who may not wish to surrender their independence to a larger umbrella org.
- Could this give the government political power over which projects it chooses to support and which it doesn't (and potentially cause a conflict of interest on controversial issues such as encryption?)
    - Matthew Hodgson no: governments already have many ways to exert control over projects via legislation; being worried about losing funding due to being at

odds with the government politics feels like a lesser concern. Presumably this can also be codified.
- Could this be seen as simply funding the R&D of for-profits which build on that open source project?
  - Matthew Hodgson Yes - but the fact that this benefits *everyone* (both for-profits, governments, non-profits, individuals etc) is the nature of the commons. In fact the positive economic benefits of accelerating both nonprofit and for-profit usage of the commons FOSS project should be significant, rather than the growth of the FOSS project being sabotaged by the limitations of self-funding.

Related discussions/proposals

- https://mastodon.matrix.org/@webmink@meshed.cloud/112223452003685677
- European Public Digital Infrastructure Fund White Paper - Open Future Foundation
  - "For services and tools that have demonstrated the ability to deliver public value, public support can be the only viable business model."
- Towards Sovereign AI: Europe´s greatest challenge? – Euractiv
  - "Europe should develop a comprehensive strategy and allocate substantial funding, starting with a €10 billion EU Digital Sovereignty Fund..."
- Development of a Funding Mechanism for Sustaining Open Source Software for European Public Services
  - It must be close to what we propose (which also involves Gijs Hillenius).
- National Public Fund to Finance Open Source Ecosystem
- Tragedy of the Digital Commons - Chinmayi Sharma
  - Another highly referenced and should-be-relevant study by Chinmayi Sharma
- https://digitalpublicgoods.net/standard/
- OSPOs for Good 2024 | Office of the Secretary-General's Envoy on Technology
- https://joinup.ec.europa.eu/collection/fosseps/news/funding-sustainability
- A European Public Digital Infrastructure Fund
- https://www.diplomatie.gouv.fr/en/french-foreign-policy/digital-diplomacy/news/article/joint-statement-by-the-ministry-for-europe-and-foreign-affairs-and-the-state
- https://commons.ngi.eu/2024/01/18/ngi-commons-officially-launched/

Discussion points

(Experimental area: I'm not sure whether it would be helpful, but we can have this separate section to list and discuss different views.)

Scope: What should be the scope of the public fund?
- The fund should only finance FOSS, which public institutions rely on.
- The fund should finance FOSS, which both public and private sectors rely on.

Evaluation process: How should the fund determine which organisations will receive funding?
- Manual review process
- Data-driven